

# PATENT COOPERATION TREATY

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

|   |  |  |  |                      |
|---|--|--|--|----------------------|
| Applicant's or agent's file reference<br>11321P069WO  |  | <b>FOR FURTHER ACTION</b>  |  | See Form PCT/PEA/416 |
| International application No.<br>PCT/US2004/020108  |  | International filing date (day/month/year)<br>23.06.2004           | Priority date (day/month/year)<br>23.06.2003 |                      |
| International Patent Classification (IPC) or national classification and IPC<br>C08K7/06, C01B31/02, C08K9/04   |  |  |  |                      |
| Applicant<br>WILLIAM MARSH RICE UNIVERSITY et al  |  |  |  |                      |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |  |  |  |                      |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>  |  |  |  |                      |
| Date of submission of the demand<br>17.01.2005  |  | Date of completion of this report<br>29.06.2005                    |  |                      |
| Name and mailing address of the International preliminary examining authority:<br> European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465   |  | Authorized Officer<br>Telephone No. +49 89 2399- 8519<br>Frisay, C |  |                      |



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/020108

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-25 as originally filed

**Claims, Numbers**

1-68 as originally filed

**Drawings, Sheets**

1/9-9/9 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

|                               |             |      |
|-------------------------------|-------------|------|
| Novelty (N)                   | Yes: Claims |      |
|                               | No: Claims  | 1-68 |
| Inventive step (IS)           | Yes: Claims |      |
|                               | No: Claims  | 1-68 |
| Industrial applicability (IA) | Yes: Claims | 1-68 |
|                               | No: Claims  |      |

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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Concerning point V

Preliminary considerations

The applicant's attention is drawn to the fact that one european document (EP1349179=D4) published between the claimed priority date and the filing date of the present application was found. This document would be considered as document according to Art. 54(3) EPC in the European Phase. In order to allow the examining division to check whether D4 is a Art. 54(2) EPC or a Art. 54(3) EPC document, the applicant is requested to send a copy of the priority document.

Claim 54

Claim 54 defines the broadest subject-matter of the application. It relates to a CNT-elastomer composite comprising functionalized CNTs in an elastomeric matrix. This is not new in view of:

D1 (see cl. 1&2; paragraph [31] which indicates that the surface of the CNT is preferably pretreated, which means functionalized),  
D2 (see cl. 11&97; p. 3, l. 35-37; p.18, l. 27-37),  
D3 (see cl. 1 and paragraph [18]).

The subject-matter of claim 54 is thus not novel (Art. 33(2) PCT).

Claim 1

The method of claim 1 is not new in view of D1, which teaches a similar method where the pretreated CNT and the matrix are hardened after mixing (see cl. 8). The same applies for D2 (see fig. 21 for ex.; also p. 19, l. 27-32).

Claim 25

The method of claim 25 is not new in view of D1 (see paragraph [29]) where use of surfactant and hardener is strongly recommended (see also cl. 8)).

Claim 41

The method of claim 41 is not new in view of D4 (see paragraph [26] which teaches

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dispersion in a solvent followed by evaporation.

Providing an amended main claim which meets the requirements of Art. 33(2) PCT , the applicant should relate the distinguishing feature to a surprising (unexpected) technical effect or make credible or plausible that the distinguishing feature is not derivable from the prior art teaching.